Xin D indep; identical YilXi,BNBe(exits) Ln(b(Y/X)=[[YiXiT] Goal: Tat Ho: Bj=Bj H1: 12 = 189

Hypothesis tests for Logistic Regression Yi E 20,13, Xi ERP (Xi, Yi) independent, Yim Re(pi)
responses P(Yi=yi|pi) = { pi # yi=1 } = pivi(1-pi)1-yi B= arguax lu(Bly, X) = exp(y, log p;+ (1-y;) log (1-p;)) = exp(y, log p; + log (1-p;)) => n= log Pi => en= Pi => (1-pi)eni-pi =ni-XiB 1 Wald test => P(Y= yi | XiB) = exp(yi XiB+ log(1- exiB) 2 Hower = exp (yiX; } - log (1+ exi) s 3 Likelihood ratio test

XinD indep; identical YilXi,BNBe(exita) CalyIX)= ElyiXil -69 (1+exip B= orguex by BY(X) Spal: Test Ho: Bj=Bj H1: R = + B?

2 POWET Like inom rarates 1) Y,,..., Yn~ The, BETR', iid., & MLE, tot Ho: 0-0°, H,: 0+0° Tn=n.(6-00) I(6).(6-00) 2 Xd moder Ho =-E[V2e,(014,)] Theorem for ME. TI(G-6) ~ N(0, I(6)-1)  $\Rightarrow n(\hat{\mathbf{G}} - \hat{\mathbf{G}})(\hat{\mathbf{G}} - \hat{\mathbf{G}}) \xrightarrow{\mathcal{D}} \chi_{\hat{\mathbf{d}}}^2$ => Shristey's Thin (6-6) I (8) (6-6) 2 200 20 1-12 The Jack 20 1- x qu.

Sureley (I(B)-1) in 200 2

Î[B]=-LŽ V2,(BIYi,Xi), Mer Î[B] T IB)

Octol: I(B) = - E[V2R,(BIY,,X,)] YilXi,BNBe(exita) 上(B)=一点正文(Blyi,Xi) (16/4/X)= [[Y:XiT] B= orguex la Bly X Del, = Yi Xik- T+exits.exitsXik dédre, =-Xite XiteXits. (1+eXit)-XiceXitseXits Spal: Test Ho: Bj=Bo Tw=n(3-80)2
Tw=n(3-80)2
(1(3)-1)37=115Th/29(22) = -  $\chi_{\text{Pe}}\chi_{\text{if}} \cdot \frac{e^{\chi_{\text{i}}\gamma_{\text{s}}}}{(1+e^{\chi_{\text{i}}\gamma_{\text{s}}})^2} P_{\text{i}}(1-p_{\text{i}})$ I(B) = 1 2 XieXie (1+eXits)2 2 Power

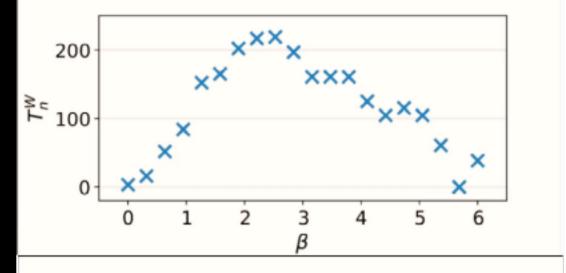
3 Likelihood tatio test

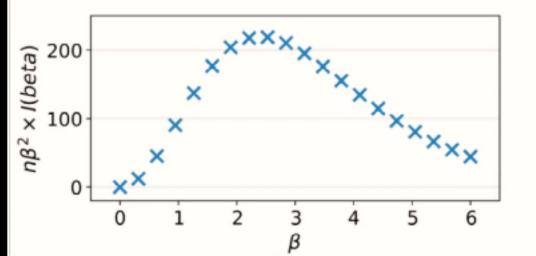
XinD indep ; identical YilXilBNBe( Ttexits) (6/1/X)= [[Y:XiT] -log(1+exits Spal: Tet Ho: Bj=Bo Hi: Bj + Bio I(B) kp=152 XikXil 1+exitps)2 2 Tower 3 Linelinood tatio test

2 χι~ Belt), γι~ Be(=χίβ), β+0, β0=0

π [[β(β-β+β)]~ N(π[ββ, 1)

Τω= η β² (β) "~" χ², (η [(β) β²) non-cuntral χ²





XinD indep; identical YilXi,BNBe(ExiTA) (16/4/X)= [[YiXiT] B= orguex la Bly X Goal: Test Ho: Bj=Bj Hi: Bi + Bio Tw=n(3- 50)2 Tw=n(13- 50)2 XiTps I(B) kp=1 = XiXiXiV = Xi 13 2) Power 3 Likelihood tatio test

2) Xi~ Belt), Yi~ Be(exip), B+0, B0=0 TO TEB (PS-P+PS) ~ N(TOTE) P , 1) The n p2 f(p3) "~ " X2 (nI(p) p3) I(B) = E[Xi = (1+exip)2] = 1.eB 132 I(B) = 1. (1+eB) 2 0 2 2 (1+eB) 2B 

non-central 2 L'Hospital's rule: 00 f(x), g(x), x > c f(x)-100, g(x), f of differentiable = f(x) = Lim f'(x) x = C g'(x) x = C g'(x)

XinD indep ; identical YilXi,BNBe(Exits) (15/1/X)= [[YiXiT] -log(1+exits) B= orguex br(B1) Spal Test Ho: Bj=Bj 1) Wald test In=N(B- 60, I(B) kp=1 = Xikxil (1+exitps)2 2 POWER 3) Likelihood tatio test

3) Likelihood ratio test: calculate \$ &

\[
\beta^c = \text{argmax ln(\beta(\beta(\beta)\beta,\times)} \\
\beta\_j = \beta\_j^c \\
\beta\_j = \beta\_j^c \\
\beta\_n = 2 \left(\beta(\beta(\beta(\beta)\beta,\times) - \beta\_n(\beta^c(\beta(\beta)\beta,\times)) \\
\beta^{LR} = 2 \left(\beta(\beta(\beta(\beta)\beta,\times) - \beta\_n(\beta^c(\beta(\beta)\beta,\times)) \\
\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta^c(\beta(\beta)\beta)\beta\_n \beta\_n(\beta^c(\beta(\beta)\beta)\beta\_n) \\
\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta(\beta(\beta)\beta)\beta\_n \beta\_n(\beta^c(\beta(\beta)\beta)\beta\_n) \\
\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta^c(\beta(\beta)\beta)\beta\_n \beta\_n(\beta^c(\beta(\beta)\beta)\beta\_n) \\
\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta^c(\beta(\beta)\beta)\beta\_n(\beta^c(\beta(\beta)\beta)\beta\_n) \\
\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta^c(\beta(\beta)\beta)\beta\_n(\beta^c(\beta(\beta)\beta)\beta\_n) \\
\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta^c(\beta)\beta\_n) \beta\_n(\beta^c(\beta)\beta\_n) \\
\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta^c(\beta)\beta\_n) \\
\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta^c(\beta)\beta\_n) \beta\_n(\beta^c(\beta)\beta\_n) \\
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\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta) \beta\_n(\beta) \\
\beta^{LR} = \beta\_j \beta\_n \beta\_n(\beta) \beta\_n(\beta) \\
\beta^{LR} = \beta\_j \beta\_n(\beta) \beta\_n(\beta) \beta\_n(\beta) \\
\beta^{LR}

